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Subject: HWA at the Fanny Bennett tract

This is a follow up to our visit to the Fanny Bennett tract to evaluate the recently discovered hemlock woolly adelgid infestation.

The existing density of the hemlock woolly adelgid (HWA) observed in the lower canopy indicates a healthy and building pest population. There is currently (December 20, 2001) no sign of damage to the trees and most of the branches produced abundant shoot growth during the past growing season. In all likelihood, this infestation is less than 2-3 years old.

HWA was first discovered in West Virginia in 1992 in four eastern counties including the Greenland Gap area in Grant County. Monitoring plots at the Gap were established in 1993 as part of an east wide effort to determine the impacts of this exotic pest and continue to be followed. Hemlocks at Greenland Gap and elsewhere where infestations developed early on are now either dead or in a severe state of decline. There is no sign of hemlocks being able to recover.

Once infested, tree decline and mortality typically occurs within a 4-10 year period. The presence of other stressors and existing tree health plays a large role in how fast trees decline. The mature hemlocks at the Fanny Bennett tract are probably well past their prime and could go rather quickly if the adelgid is not controlled. To my knowledge, this is the first stand of "old growth" hemlock to become infested so it is difficult to predict how these trees will respond.

There are no parasites that attack HWA and there are no native predators capable of controlling HWA in eastern North America. Extended cold winter temperatures that expose susceptible life stages of the adelgid can reduce populations by as much as 90 percent but populations often rebound the following year. There are no management options involving insecticides that offer complete protection for hemlocks from HWA in the forest setting. Chemical treatment options that we can consider would involve individual trees rather than broad applications and must be implemented prior to any sign of decline in tree health.

Infested trees at the Fanny Bennett tract will likely stop producing new growth within 2 years, which often precedes the more obvious signs of tree decline. Foliage and branch dieback will become evident in the 2-4 years following and mortality among the suppressed and intermediate

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trees will often become evident. In 4-7 years, significant tree mortality will occur among the more dominant positioned hemlocks. The magnitude of tree mortality is accelerated when other stressors such as drought become a factor. Most surviving trees will linger for several additional years in a weakened condition before finally succumbing to secondary agents such as the hemlock borer or root rot. Hemlocks that seem to survive the longest are those positioned favorably on the best growing sites, which are typically the lower slopes where droughty conditions will have the least impact.

Because hemlocks at Fanny Bennett are relatively healthy, there are two management strategies that could provide some level of protection. The first would involve an insecticide injection into the bole of selected "specimen" trees. The insecticide is a product called Pointer® and has been used successfully elsewhere to control HWA on individual trees. The second strategy would be to establish natural enemies of HWA. In particular, *Pseudoscymnus tsugae,* a tiny ladybird beetle that is highly host specific on adelgids and has proven to be an effective predator in Japan. This predator is currently being evaluated as a long-term control strategy in 11 states and is supported by Forest Health Protection in the Northeastern Area and Region 8. Several other HWA predators are currently being evaluated but have not yet been available for release.

Again, it is critical to begin implementing any control effort before trees begin to decline. My recommendation is that management actions be initiated this spring for the best chance of success. Once the trees stop producing new shoot growth, movement of the insecticide to the target area in the crown becomes increasingly difficult. Likewise, beetle predators will need several years to reproduce in sufficient numbers to have a chance of succeeding. Unless there is an extreme cold snap that occurs in late February to March, HWA populations will continue to increase at an accelerated rate in this stand.

The beetles would be provided at no cost and the average cost for treating a large hemlock with Pointer® is about $40 per tree. I would suggest we consider treating possibly 75-100 hemlocks with the insecticide and make an initial release of 10,000 *P. tsugae* beetles.

I've enclosed several EA's that should provide some background information on the predatory beetle, *P. tsugae* and a label for the insecticide that is currently used for controlling HWA on individual trees.

If you would like to pursue either or both of these management strategies, please contact me as soon as possible to begin planning.

Sincerely,

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Entomologist
USDA Forest Service

BPO/blm

cc: Liz Schuppert, Cheat Ranger District
Sherri Hutchinson, WV Dept of Agriculture
Noel Schneeberger, AO